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Services: innovation, performance and public policy

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Executive summary

Modern economies are inescapably service economies. For several decades now, services have been our main source of wealth and jobs. However the service society is still quite frequently associated with negative images of servitude, state bureaucracy and industrial decline. These images are recurrent in periods of economic crisis.

Despite some recent improvements, innovation efforts and performance levels in services are underestimated. Service economies are characterized by the existence of two gaps: an innovation and a performance gap. These gaps may have harmful consequences for the validity of the public policies implemented at national or European level.

1. Services: myths, specificities and new visions

In order to understand properly the underestimation of innovation in services, we need, firstly, to reconsider certain myths associated with services and, secondly, to examine in a more analytical manner the specificities generally attributed to service activities. These two points are of course closely linked. We also need to address the « all is service » hypothesis which is emerging in modern postindustrial economies.

1.1 Four recurrent myths can be said still to be causing confusion in the analysis of services and innovation in services: 1. the myth of the unproductive, ‘third’ sector ; 2. the myth of low capital intensity; 3. the myth of low productivity and 4. the myth of the society of ‘servants’. Although statistical evidence contribute to qualify theses myths, they are still alive.

1.2 A certain number of particular concrete analytical problems also contribute to the underestimation of innovation in services. They arise out of the intangible and interactive nature of the service output, the property rights issue and the heterogeneity of services.

1.3 However the recent literature shows some convergence between goods and services, that is to say, a dialectic between the industrialization of services and the “servicisation” of goods. The blurring of boundaries and the trend towards “all service” are manifested in different ways: 1) the increasing role of information and service in the value of most goods; 2) the widespread trend toward “industrial services”; 3) goods and services increasingly sold and consumed together as packages, solutions, systems, functions or experience; 4) the transformation of iconic industrial enterprises into service companies; 5) the emergence of

new business models based on leasing goods rather than selling them or refurbishing or recycling goods rather than manufacturing them.

2. Service innovation: making “invisible innovation” visible

Although much remains to be done to do justice to and make the most of the business activities driving today’s economies to a large extent, the literature on innovation in services has undeniably taken off in recent years.

2.1 The initial reduction of innovation in services to the simple adoption of technical systems, was followed by attempts to identify specific forms of innovation invisible to traditional apparatus.

Visible innovation is innovation measured by traditional indicators, such as R&D and patents. It reflects a *technological, assimilationist and subordinate* vision in which innovation is, in the main, rooted in science-based technical systems.

Invisible or hidden innovation represents a major and still neglected field of research. Its diverse expressions are often grouped under the heading of *non-technological innovation*. While it is not embedded in a technological artefact, it may be linked in various ways with and complementary to technological systems. Invisible innovation is also frequent in manufacturing, agriculture and civil society. This is linked to the « convergence » or « all service » hypothesis evoked earlier.

2.2 On the basis of the last innovation surveys conducted in EU, one can formulate a certain number of general results as regards innovation and its nature: i) Services are active in terms of innovation in all EU countries. They cannot be considered as laggards; ii) Certain service subsectors are more innovative than others (for example KIBS, engineering). They are even more innovative than manufacturing; iii) Non-technological innovation takes an important place in services. There is relatively more non-technological innovation in certain services than in manufacturing; iv) All sectors (and not only services) innovate by introducing new services.

2.3 Despite some progress (the integration of organizational and marketing innovation), certain non technological innovation forms still escape OECD Manuals and Community innovation surveys.

The *innovation gap* has narrowed, although there is still room for improvement, particularly in the following fields: non-technological product innovations (a new insurance contract, a new financial product, or a new field of consultancy expertise, for example), non-technological process innovations (methodologies and protocols), ad hoc and custom-made innovations, innovation in public services, innovation in complex packages, new concepts, and new formulas (for example in commerce, hostelry, etc.).

2.4 It is also likely that our definition of R&D is not adapted to services. The latest version of Frascati Manual (2002) continues to be characterized by a technician and scientist bias while R&D activities in services often have a composite character, mixing aspects of S&T, H&SS, organizational engineering, etc.

2.5 There is a sectoral shift in empirical surveys devoted to the specific nature of innovation in services. The earliest studies focused on KIBS, particularly consulting, banking and insurance. These were followed by studies on less knowledge intensive services (e.g. transport, cleaning and care services for the elderly). There has also been a recent renewal of interest in innovation in public services. Forms of non-technological innovation have been identified everywhere, and they are generally not detected by traditional tools.

2.6 While the linear model of innovation in services, it is the open innovation model, which is currently the most frequent and often the most relevant.

However « open innovation » is an umbrella concept, which contains different models which have the particularities of being cooperative, interactive and non-necessarily formalized. It therefore includes, the chain linked or interactive model. But it also includes several non-programmed or emergent models of innovation (rapid application, practice-based, bricolage, ad hoc). Open innovation also includes user-driven innovation models and new forms of public-private cooperation such as public private innovation networks in services (ServPPINs).

3. Drivers and megatrends in innovation in services

Megatrends are long term radical socioeconomic transformations. They cover or determine, of course, radical innovation but also incremental ones. These megatrends are based on different drivers of innovation in services which interact in various ways and may compete or reinforce each other: 1. Industrialisation of services; 2. Technology (especially ICT) and R-D; 3. Globalisation/competition; 4. Demographic variables; 5. ICT-literacy; 6. Customisation; 7. Deregulation...

3.1 The first interesting megatrend, in services, concerns the dialectic relationship between industrialisation (productification) and customisation (servicisation). It has been at work since several decades, but its potential for evolution is still considerable, particularly under the influence of two other drivers: ICT and ICT literacy.

3.2 The second megatrend is ageing and its various consequences on innovation in services.

3.3 A powerful megatrend, which is still at its initial step, is the megatrend based on the sustainable development question especially in its environmental dimension.

3.4 The service regression dynamics is also considered as a major megatrend. It may seem paradoxical to link the terms innovation and regression. It is nonetheless the case that innovation processes in many service activities follow a service reduction trajectory. Examples include air transport low cost companies, budget hotel chains, hard discount and fast food industry.

3.5 Another interesting megatrend is the rise of what is called “industrial services”. These are the whole range of services provided during the production or the selling of an industrial product: pre-sales, at-sales, after-sales services and independent from sales services.

4. Innovation gap, performance gap and policy gap

4.1 Economic performance also poses serious definition and measurement problems and here too hidden forms of performance can be identified. There is also a performance gap.

The terms of this critical debate as regards *productivity* and *growth* (i.e. as regards the performance gap) can be divided into two groups of arguments.

The first argument concerns measurement error. The hypothesis is that the level of productivity in services is undoubtedly less problematic than the methods used to measure it.

The second argument calls into question the absolutism of the notion of productivity. The idea is that, in services to a greater extent than elsewhere, a multi-criteria form of assessment is required, one that takes account of the multiple dimensions of performance: technical performance (productivity) of course, but also commercial performance (relative to monetary and financial values), civic performance (relative to equity, equal treatment, social cohesion, respect for the environment, etc.) and relational performance (quality of interpersonal relations, empathy, trust relations, etc.).

4.2 Different relationships between visible and invisible innovation and performance should be taken into account : not only the relationship which links visible technological innovation to visible performance (growth, productivity) (R 1), but also the relationship between visible innovation and invisible performance with regard to socio-civic and ecological sustainability (R 2); the relationship between invisible innovation and visible performance (R 3) and the relationship between invisible innovation and invisible performance (R 4).

Not to take into account the whole set of relationships may lead to errors in analysis and paradoxes: for example a weak innovation effort at the same time as a high (growth) performance, when invisible innovation efforts are not taken into account.

4.3 In order to carry out their diagnosis, public policies generally favour R 1, which links visible technological innovation to visible performance (growth, productivity).

In view of the diagnosis established on the basis of R 1, the solutions recommended by the public authorities naturally consist of promoting technological innovation (based on scientific and technical R&D activities and patents appropriation), focusing on public research and industrial sectors, in particular high technology, favouring scientific and technological training.

4.4 To take into account the double gap, the public authorities should also try to promote invisible innovations and performances. It is thus necessary to emphasise innovation and R&D policies that are specific to services, in other words, policies which also favour non-technological forms of innovation and R&D.

It is also necessary to support services innovations within manufacturing and agricultural sectors. Public policies should also support (in the education system) the development of specific skills needed for non-technological innovation.

All services are concerned by these innovation policies. But some sectors appear to be more concerned than others. This is the case with the KIBS and the numerous proximity services, where many social innovations are implemented.

Services: innovation, performance and public policy

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Introduction

Modern economies are inescapably service economies. For several decades now, services have been our main source of wealth and jobs. In fact, services represent more than 70 % of employment, and value added. The process of deindustrialisation began a long time ago in all the developed countries (1955 in the US, 1950 in the UK, 1973 in France and 1980 in Japan, for example). While it is hardly surprising that the profound economic and social upheavals linked to deindustrialisation have given rise to anxieties, both legitimate and fantastical, the persistence of these anxieties in certain cases is, on the other hand, quite difficult to understand. After all, the service society is still quite frequently associated with negative images of servitude, state bureaucracy and industrial decline. Thus despite some changes of attitude, it is still sometimes regarded with a certain degree of suspicion, in both academic studies and political discourse¹. These academic and political concerns which are recurrent in periods of crisis are based on a number of particularly hardy myths about the service economy and its performance, the quality of its jobs and its capacity for innovation.

Thus the relationship between services, on the one hand, and innovation and performance, on the other, continues to be a matter of considerable debate. In the still influential industrialist or technologist approach to this relationship, innovation efforts and performance levels in services are underestimated. It is this approach that is responsible for the existence of two gaps: an innovation gap and a performance gap. The innovation gap indicates that our economies contain invisible or hidden innovations that are not captured by the traditional indicators of innovation, while the performance gap is reflected in an underestimation of the efforts directed towards improving performance in those economies. These gaps have their origin in the more or less ancient myths about the fundamental nature of services and the errors of measurement associated with them. They may have harmful consequences for the validity of the public policies implemented at national or European level. Since they are based on imperfect or even erroneous forecasts, these policies may also prove to be inappropriate. The aim of this work is to help fill the innovation and performance gaps, or in other words to

¹ Here are illustrations of the concern drawn from the discourses of influent French policy actors (similar illustrations can be found in other countries).

« We need a strong French manufacturing industry...(...). France *cannot be only* an economy of banks, insurances and services...». (Nicolas Sarkozy, while he was Minister of economics: France Info, 16 April 2004).

« Our efforts must be focused primarily on production and particularly on industrial production, on the creation of *real* jobs, jobs that are *directly productive*... ». (Dominique Strauss-Kahn while he was Minister of economics: Le Monde, 1998).

« Manufacturing industry is the basis of competitiveness. The “service society” is based on manufacturing activity: the creation of jobs in services *depends* on a large extent on it, (...) manufacturing is *the sole* determinant of competitiveness in global markets (...) » (Raymond Barre, former prime minister, former economics minister, Le Monde, 1991).

Suspicion and concerns about the service economy formulated in theoretical literature can be illustrated by following references: “Manufacturing matters”, Cohen and Zysman (1987); “Too few producers”, Bacon and Eltis (1978) and more recently “La France sans ses usines”, [France without its factories], Patrick Artus et Marie-Paule Virard (2011) and « Réindustrialisation, j’écris ton nom » [Reindustrialization, I write your name], Jean-Louis Levet et al. (2012).

rescue these invisible innovations and forms of performance from the relative oblivion to which they have been consigned.

This work is organized into four sections. The first section is a framing section devoted to a discussion of the main myths about services and innovation in services and to the real or supposed specificities of these activities. It also addresses the hypothesis of the convergence between goods and services and the blurring of their boundaries. The second section is devoted to an account of the notion of service innovation, from the point of view of its nature, and its organisation processes. The third section addresses, in a prospective way, a certain number of megatrends of the innovation dynamics in services. In the fourth section we analyze how the innovation gap and the performance gap interact and may lead to a policy gap.

1. Services: myths, specificities and new visions

In order to understand properly the underestimation of innovation in services, we need, firstly, to reconsider certain (old but still alive myths) associated with services and, secondly, to examine in a more analytical and concrete manner the specificities generally attributed to service activities. These two points are of course closely linked. This section also addresses the « all is service » hypothesis which is emerging in modern postindustrial economies.

1.1 The Myths

Most of the views outlined here are relatively old. Some are rooted in the history of economic thought. There would be no difficulty at all in demonstrating that they continue to exert influence through those present-day economic and political discourses that still warn us of the risks and limits of the service economy (for illustration see footnote 1). To simplify somewhat, four myths (artificially separated out here, but obviously linked) can be said still to be causing confusion in the analysis of innovation in services:

1. the myth of the unproductive, ‘third’ sector,
2. the myth of low capital intensity,
3. the myth of low productivity and
4. the myth of the service society as a society of ‘servants’.

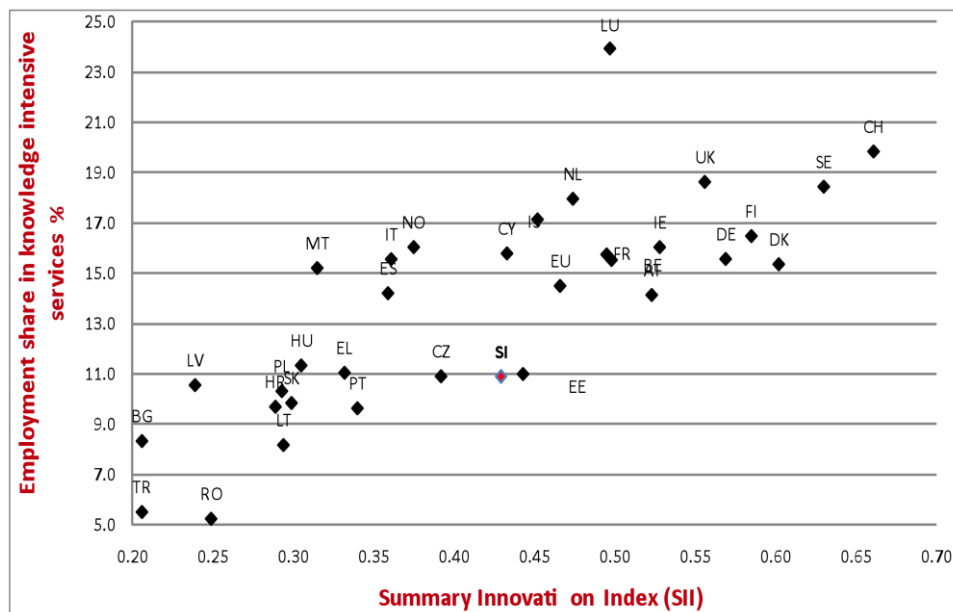
a) Unproductive services and the ‘third’ sector

The notion of services as an unproductive activity with no economic value has its origins in the history of economic thought, and in particular in the work of Adam Smith (1960), who makes a distinction between the productive work of manufacturing and the unproductive work that characterizes service activities, which fade away at the very moment they are realized. This analysis, developed for services reduced to little more than the work of domestic servants, servants of the state and artists, continues to influence many present-day approaches. While the accounting concerns of the first theorists of the service sector (particularly Fisher, 1935; Clark, 1940) led to a residual, negative definition of services (everything that is not agriculture or manufacturing) that does not constitute a value judgement on the economic worth of the tertiary sector, the same most definitely cannot be said of other, more recent analyses. These analyses contain a number of negative assessments of the service sector (‘peripheral’, ‘pathological’...) which, taken as a whole, contribute to what, by analogy with the third world, we describe as the myth of the ‘third sector’. There are numerous studies

deploring the growth of the service sector. We will confine ourselves here to citing just a few particularly suggestive examples (see also footnote 1). In a study revealingly entitled ‘Manufacturing matters’, Cohen and Zysman (1987) take the view that services are ‘peripheral’ activities that impede the functioning of manufacturing industry, which is regarded as the only engine of economic growth. Adam Smith’s vision of services as unproductive also lies at the heart of the study by Bacon and Eltis (1978) entitled ‘Too few producers’. The service sector is also suspected of having been the culprit in the economic crisis of the early 1970s (Aglietta and Brender, 1984; Lorenzi et al., 1980) and the image of services as a ‘pathology’ flourishes in the economic literature (cf. in particular Attali, 1981). There is a revival of such concerns in the current economic crisis as illustrated by following recent references : “La France sans ses usines”, [France without its factories] Artus and Virard (2011) and « Réindustrialisation, j’écris ton nom » [Reindustrialization, I write your name], Jean-Louis Levet et al. (2012).

However in our modern economies services not only create value, but they may even add value to goods themselves (and indeed in some cases may actually constitute the main source of value added). This applies to services that supplement goods or to product-related services, that is services provided when a manufactured good is produced or sold, whether before, after or during a sale, or even independently of a sale (Mathieu, 2001; Davies, 2004). But this also and above all applies to KIBS (for ex consultancy services, engineering, etc.) which are powerful growth engines, as far as they induce innovation and productivity in other sectors. Figure 1 illustrates for European countries the correlation between the employment share in knowledge intensive services and innovation scores assessed by the Summary Innovation Index.

Figure 1: Knowledge intensive services and innovation (Cor. Coef = 0,81)
(Source: European Innovation scoreboard, 2008)



b) Low capital intensity

The second myth conveys the notion that the service sector is characterized by low capital intensity. The myth of low capital intensity is linked to the absence of factories and large-scale production lines in the service sector. This myth is very resistant even to those statistical investigations which, from the studies of Kutscher and Mark (1983) onwards, have concluded that capital intensity in services is in fact high. This has always been the case in some activities (particularly energy distribution and transport in its various forms) and has become so in others that are now the main users of information and communication technologies (banking and insurance, for example).

c) Low productivity

The main criticism made of the service economy is its low productivity. This criticism manifests itself in the contemporary discourse through the diagnosis of a new pathology, namely Solow's paradox, which states that information technologies are to be found everywhere except in the productivity statistics. This criticism can be challenged in various ways.

Firstly, it has to be noted that service activities have for several decades been experimenting successfully with rationalisation strategies that seem to increase both productivity and performance (Gadrey, 1996; Djellal and Gallouj, 2008). These strategies are at work everywhere, whether in knowledge-intensive services (engineering, consultancy) or in more operational services. In the first case, the rationalisation takes what Gadrey calls a 'professional' form (development of methods and 'toolboxes', standardisation of activities and service offer, etc.). In the second case, the rationalisation is 'industrial' in nature (and indeed is sometimes described as 'industrialisation'). In particular, this 'industrialisation' may denote a process leading to the production of tangible goods to the detriment of the provision of intangible services and the implementation in service firms and organisations of a certain mode of production (the type of work organisation and technologies that predominated in the heavy industry of the post-war period).

Secondly, performance in service activities cannot be captured solely through the notion of productivity. Attempts to measure this industrial and technical indicator come up against the difficulty of identifying the output or product of service activities. Thus the level of performance in services is undoubtedly less problematic than that of our methods for measuring that performance. It is preferable, therefore, to adopt a multi-criteria method of evaluation that takes account of the many and various facets of performance (see section 4.1).

d) A « society of servants »

The fourth myth concerns the quality of labour as a production factor in the service economy. It constitutes an attack on what might be considered one of the strengths of services, namely their job creating ability. Once again, we will not examine these studies in detail but confine ourselves to singling out a few particularly telling phrases. Thus as far as job creation is concerned, the service society is said to be nothing other than a 'society of servants', a 'hamburger society' and a 'bad jobs society' (Bluestone and Harrison, 1986; Cohen and Zysman, 1987; Gorz, 1988; Thurow, 1985; Mahar, 1992). Once again, there is no difficulty in adducing statistical evidence to give the lie to these analyses. While it is true that the service society creates deskilled jobs, it is equally true that it is also the main source of jobs for managerial staff and high-level professionals (Meisenheimer, 1998; Illeris, 1996; Gadrey, 2003).

These prejudices persist today and the question of services and employment is viewed ambiguously, sometimes with a certain feeling of guilt. Public policies have sought to encourage job growth in the service sector, but as temporary support measures in times of crisis while waiting for ‘real’ jobs’ to be created. Nevertheless, the problems for contemporary developed economies is sometimes less their degree of deindustrialisation than their delay in developing as service economies. Such a delay can be observed when employment in Europe and the USA is compared (Gregory et al., 2007).

Here too, these negative judgements do not stand up to statistical analysis. While it is true that the service society creates low-skill jobs, it is equally true that it is now the main source of opportunities for high-level managers and professionals. Thus two employment models or systems can be identified in service activities (including the more operational services, such as cleaning): a neo-Taylorist model characterised by quantitative flexibility and an (emerging) model based on ‘organisational adaptability’, which reflects an increase in the level of professionalisation in services. We should also note here the significant development of certain human resource management services whose objective is to improve the skill levels of employees in firms and organisations.

1.2 The specificities of services (and their consequences on innovation)

The various myths outlined above can be regarded as the general context that helps to sustain the underestimation of innovation in services. Over and above this general context, there are also a certain number of particular concrete analytical problems that also (through the way in which they are apprehended) contribute to this underestimation. They arise out of the ill-defined nature of the output of service activities, the interactive nature of the act of service delivery, the property right issue and the heterogeneity of services.

The *intangibility* of a service refers to the fact that its product is an act, a treatment protocol or a formula (in other words, a process and an organisation). In many cases, it is difficult to map the boundaries of the service. The “topography” of services should not only take into account their degree of materiality or tangibility, but also the service’s timeframe (the service “in acts” as opposed to its long-term effects). In other words, unlike a good, a service does not have an independent existence enshrined in its technical specifications. It is a *social construction* that exists in various ways in *time* (time horizon) and in the *tangible world* (degree of tangibility). The fuzziness (immateriality and intangibility) of output has a number of implications for innovation analyses (see table 1). It can deflect analyses towards the most tangible components of the service, particularly processes (whether they are innovative or not). It makes it difficult to distinguish between product innovation (generally understood as the development of new functionalities and qualities) and process innovation (to reduce costs), to estimate the degree of newness (and the difference between a real innovation and traditional differentiation and diversification mechanisms), and to enumerate the innovation or assess its economic impact (in terms of jobs or impact on sales, for example). The intangible and volatile nature of the “product” compromises efforts to protect the innovation and facilitates its imitation. On the other hand, intangibility makes it possible to envisage the existence of intangible product and process innovations, as well as forms of innovation that aim to make the service less fuzzy (formalization innovation).

Interactivity, the second characteristic of services, refers to a certain form of customer participation in the production of the service (coproduction). It has different theoretical consequences for innovation, both in terms of its nature and the way in which it is organised. It reveals the importance of certain specific forms of innovation (custom-made innovation and ad hoc innovation) which escape both theoretical apparatus and traditional measurement tools. It does not appear to be compatible with the traditional linear conception of innovation which assumes the existence of specialist R&D structures independent of production and marketing structures. On the other hand it is particularly consistent with the interactive innovation model (Kline and Rosenberg, 1986), which focuses in particular on project groups of varying sizes, involving different company professionals as well as customers (see section 2.3). Therefore, the customer is not only the co-producer, he may also be the co-innovator, which raises innovation appropriation problems.

Table 1 : Service specificities and their analytical consequences on innovation

Service specificities	Analytical consequences on innovation: nature and organisation
Product is a fuzzy process	<ul style="list-style-type: none"> - Difficulty to distinguish between product, process and organisation innovations - Difficulty to numerate innovations - Difficulty to assess innovation economic effects (for example in terms of employment or effects on sales) - Difficulty to assess the degree of novelty - Easy imitation - Intangible product or process innovation - Formalization innovation
Service is interactive	<ul style="list-style-type: none"> - Importance of certain forms of innovation (tailor-made, ad hoc) - Not compatible with the traditional linear concept of innovation (based on R-D department). - More consistent with an interactive model of innovation - Client participation to the innovation process - Price fixing problems - Appropriation regime problems
Absence of property rights	<ul style="list-style-type: none"> - Appropriation regime problems
Service sector is heterogeneous	<ul style="list-style-type: none"> - Product (innovation) forms are variable - Double accounting problems in KIBS

The property rights issue is another analytical problem which involves consequences on the analysis of innovation. According to Hill (1997), what characterises services is that no *independent entity* is produced (i.e. no entity which is able to *circulate economically* independently of the medium of the service). For example the care provided to an ill person cannot be transferred to somebody else. Conversely to goods, there is no establishment or exchange of property rights. This particular form of economic circulation is at the heart of the definition of services. It has obvious *consequences on the nature of the appropriation regimes of innovation* in services. It explains imitation easiness and protection difficulties.

The service sector is one of extreme diversity. Differences in respect of innovation sometimes seem greater within the service sector than between some service industries and some manufacturing industries. For example, the innovation behavior of computer services and telecommunications companies is relatively close to that of manufacturing firms and may, to some extent, be captured by the same survey arrangements. On the other hand, the types of

'products' vary widely from one service activity to another. Thus the content of product innovation is not necessarily the same for a hotel service, a consultancy service or a financial service. The difficulty of applying the traditional definitions seems to increase in the case of services whose target is information, knowledge or individuals. Particular attention should be focused on these types of activities and, more generally, on knowledge-intensive business services. They pose particular methodological problems, in that the providers of such services, while producing innovations in their own right, are also participants in the innovations produced by their clients.

It might well be asked whether the notion that services are activities with a high degree of specificity has not itself become a myth. After all, there are many exceptions to the characteristics outlined above, but in particular they also manifest themselves in the process of producing goods. Intangible elements and interactivity are becoming increasingly important in manufacturing. Thus an investigation into innovation in services should help not only to reconcile the two basic features of modern economies (services on the one hand and innovation on the other) but also to enrich analysis of innovation in manufacturing.

1.3 New visions: blurring of sectoral boundaries

The literature shows some convergence between goods and services, that is to say, a dialectic between the industrialization of services and the "servitisation" of goods (Vandermerwe and Rada, 1998), reflecting an increase of service and the service relationship in the industrial and agricultural goods sectors. An increasing number of contemporary studies point to a blurring of boundaries between sectors and as to the nature of "products" (Barcet and Bonamy, 1999; Gallouj and Weinstein, 1997; Drejer, 2004). Some research (Broussolle, 2001) shows that ICT (as a technical system shared by industry and services) contributes to this "blurring."

The blurring of boundaries and the trend towards "all service" are manifested in different ways. For example, information and service play an increasing role in the value of most goods (industrial and agricultural). Whether potatoes, fragrance or calculators, service and information (R&D expenditures, transportation, distribution, marketing, etc.) have become major components of the value produced. The widespread trend toward "services around the product" (pre-sales services, sales services, after-sales services, etc.) (Furrer, 1997) also blurs the distinction. More generally, the need for integration is based on the finding that goods and services are decreasingly sold and consumed independently, but increasingly as solutions, systems, functions or experience. The blurring is also driven by the transformation of iconic industrial enterprises (e.g. IBM, Benetton) into service companies, to the extent that now most of their revenue comes from this type of activity. Another example of the blurring of boundaries is the new business model of certain industrial enterprises, which now lease their goods rather than selling them (Rank Xerox copiers) or refurbish or recycle goods rather than manufacturing them.

New theoretical research prospects have therefore emerged, including the functional economy (Stahel, 1997), the experience economy (Pine and Gilmore, 1999), the characteristics-based approach (Gallouj and Weinstein, 1997) and the Service Dominant Logic (Lusch and Vargo, 2006).

2. Service innovation: making "invisible innovation" visible

Although much remains to be done across a range of fields to do justice to and make the most of the business activities driving today's economies to a large extent, the literature on innovation in services has undeniably taken off in recent years (Gallouj and Weinstein, 1997; Sundbo, 1998; Miles, 2002; Den Hertog, 2002; Gallouj, 2002; Rubalcaba, 2006; Windrum and Garcia-Goni, 2008; Tether, 2005; Hipp and Grupp, 2005). A number of literature reviews have been produced recently (Gallouj and Savona, 2009; Howells, 2007; Gallouj and Djellal, 2010; Droege et al., 2009; Gallouj, 2010). Rather than going into detail about the content of these different works, we will provide an overview of certain results.

2.1 Taking into account “invisible” innovation

As far as the overall concept of innovation in services is concerned, there has been a shift in perspective (according to the framework developed by Gallouj, 1994) from assimilation to demarcation followed by integration but also inversion. The initial reduction of innovation in services to production and, more generally, to the simple adoption of technical systems, was followed by attempts to identify specific forms of innovation invisible to traditional apparatus; innovation in services and in goods were then considered in terms of integration, in a context of convergence between goods and services. *Integration* assumes that innovation in goods and in services, technological innovation (visible innovation) and non-technological innovation (invisible innovation) must be analysed using the same tools. The *inversion* perspective reflects the “revenge” of the service sector: it emphasizes the active role of KIBS in other sectors innovations.

Table 2 : Different analytical perspectives for innovation in services

(source : after Gallouj, 1994; Gallouj and Weinstein, 1997; Combes and Miles, 2000 ; Gallouj, 2010)

Analytical perspectives for innovation in services	Definition
Assimilation, industrialist, technologicistic, subordination	Innovation in services similar to innovation in manufacturing, focus on technological innovation, subordination perspective
Differentiation, demarcation, service-oriented	Focus on the specificities of innovation in services
Inversion	The role of services in other sectors innovation
Integration, synthesis	Innovation in manufacturing and innovation in services, technological and non technological innovation analysed within the same analytical framework

Visible innovation is innovation measured by traditional indicators, such as R&D and patents. It reflects a technological and assimilationist vision of innovation in which innovation is, in the main, rooted in the production of science-based technical systems. Limiting innovation to such a conception leads to a result in which services are relatively less innovative than industry, despite the advances associated with the inclusion of ICTs. This technological and scientific conception of innovation only reveals the tip of the innovation iceberg.

Invisible or hidden innovation represents a major and still largely neglected field of research that requires further exploration. Invisible innovation is not a homogeneous category. Its diverse expressions are often grouped under the heading of non-technological innovation. This convenient expression hides the sheer diversity of innovation forms, including social innovations, organisational innovations, methodological innovations, marketing innovations, and intangible product and process innovation. Hidden service innovation do not only exist in

service sectors. It is also frequent in manufacturing, agriculture and civil society. This is linked to the « convergence » or « all service » hypothesis evoked earlier.

The non-technological character of these invisible innovations does not mean that they do not or cannot rely on a tangible technology (information or telecommunication systems or modes of transport, for example), but rather that they are not consubstantial with them and in certain cases they can exist without them. In other words, it would be unwarranted to consider that innovation only exists when the novelty is embodied in a technical system. To think otherwise would be to seriously underestimate the capacity for innovation in services.

On the basis of the last innovation surveys conducted in EU, one can formulate a certain number of general results as regards innovation and its nature (see annex 1 for statistical illustrations):

- Services are active in terms of innovation in all EU countries. They cannot be considered as laggards.
- Certain service subsectors are more innovative than others (for example KIBS, engineering). They are even more innovative than manufacturing.
- Non-technological (organizational and market) innovation takes an important place in services. There is relatively more non-technological innovation in certain services (KIS) than in manufacturing.
- All sectors (and not only services) innovate by introducing new services.

The question of the nature of R-D can be raised in similar terms than that of the nature of innovation. When one looks at R-D statistics in services, one observes that R-D intensity in services is weaker than in manufacturing. However this result has to be qualified in different ways: 1) R-D intensity regularly increases in services, particularly thanks to the effect of the introduction of ICTs; 2) Certain services are already particularly R-D intensive (the KIBS linked to ICTs for example); 3) It is likely that our definition of R-D is not adapted to services. R-D in services is different. The latest version of Frascati Manual (2002) continues to be characterized by a technician and scientist bias while R&D activities in services often have a *composite* character, mixing aspects of S&T, H&SS, organizational engineering, etc. H&SS are not sufficiently taken into account, and organizational engineering is not considered at all (Djellal et al., 2003).

Certain non-technological forms of innovation (in services but also in manufacturing industry) are taken into consideration in OECD manuals and international surveys (e.g. CIS), although this is a quite recent development. The Oslo Manual devoted to innovation indicators, has been revised several times. As well as technological product and process innovations, the latest version of the manual (2005) also distinguishes between marketing innovations and organisational innovations. Successive community innovation surveys (CIS) have therefore taken into account an increasingly large number of services and certain “non-technological” forms of innovation. The *innovation gap* has narrowed, although there is still room for improvement, particularly in the following fields: non-technological product innovations (a new insurance contract, a new financial product, or a new field of consultancy expertise, for example), non-technological process innovations (methodologies and protocols), ad hoc and custom-made innovations, innovation in public services, innovation in complex packages, also called new concepts, and new formulas (for example in commerce, the hotel industry, etc.).

2.2 Sectoral shift in empirical surveys

The earliest studies devoted to the specific nature of innovation in services focused on a particular category of services (considered as the most representative of the specific characteristics of these activities), that is, knowledge intensive business services, particularly consulting (Gadrey and Gallouj, 1998; Miles et al. 1994;). The hypothesis underlying this choice is the idea that if innovation in services has specific characteristics, it is easiest to find empirical examples in the purest services (that is, the most intangible and interactive).

Research in the field of pure services and knowledge intensive services (KIBS, banks and insurance) was followed by studies relating to the specific characteristics of innovation in services, often considered as less noble or less knowledge intensive (transport, cleaning and care services for the elderly). There has also been a recent renewal of interest in innovation in public services (Windrum and Koch, 2007; Becheikh et al., 2009; Bugge et al., 2011). Measuring innovation in public services raises new problems compared to innovation in private services, such as identifying the appropriate analysis entity (what level of government for example). Another problem is accounting for the major differences among countries regarding the organization of public services and their borders.

It would be tedious and pointless to describe the many ad hoc types of innovation developed in these different activities (see Tables 3 and 4 illustrations for public services and consultancy). The important point to bear in mind is that forms of non-technological innovation have been identified everywhere, and they are generally not detected by traditional tools.

This sectoral shift of empirical studies on innovation towards “proximity” services and public services is likely to foster links between the fields of social innovation and service innovation. The fact that social innovation is often a service innovation but also just as often (and increasingly) an innovation *in* services makes the dialogue between these two fields all the more desirable. In fact, the services sector is a particularly fertile ground for social innovation. This is true of market services, taking into account the density of social interactions (particularly with customers) that characterise them. It is even more true of public administrations, in which the density of these social interactions is formed in a “public service spirit” based on the principles of fairness, equality of treatment and continuity. This is also true to an even greater degree for the rapidly expanding conglomeration of tertiary activities in developed economies, which are grouped under the term “third sector” (as far as they are neither private nor public services).

Table 3: Typologies of innovation in the public sector

<p>Halvorsen, Hauknes, Miles and Rannveig Røste (2005)</p> <ul style="list-style-type: none"> - <i>A new or improved service</i> (for example health care at home) - <i>Process innovation</i> (a change in the manufacturing of a service or product) - <i>Administrative innovation</i> (for example the use of a new policy instrument, which may be a result of policy change) - <i>System innovation</i> (a new system or a fundamental change of an existing system, for instance by the establishment of new organizations or new patterns of co-operation and interaction) - <i>Conceptual innovation</i> (a change in the outlook of actors; such changes are accompanied by the use of new concepts, for example integrated water management or mobility leasing) - <i>Radical change of rationality</i> (meaning that the world view or the mental matrix of the employees of an

organization is shifting)
Hartley (2005)
<ul style="list-style-type: none"> - <i>Product</i> : New products : New instrumentation in hospitals - <i>Service</i> : New ways in which services are provided, new ‘scripts’. Ex. Online tax self-assessment forms - <i>Process</i> : New procedures, organisational structures, systems. Ex. Administrative reorganisations - <i>Position</i> : New contexts, customers or Partner. Ex. Connexions service for Young people - <i>Strategic</i> : New goals, purposes or values. Ex Community policing, foundation hospitals - <i>Governance</i> : New democratic institutions and forms of participation. Ex. Area forums, Devolved government - <i>Rhetorical</i> : New language, concepts and definitions. Ex. Congestion charging, carbon taxes
Bekkers et al. (2006)
<ul style="list-style-type: none"> - <i>Product or service innovation</i>, focused on the creation of new public services or products. - <i>Technological innovations</i> that emerge through the creation and use of new technologies, such as the use of mobile devices and cell broadcasting to warn citizens in the case of an emergency; - <i>Process innovations</i>, focused on the improvement of the quality and efficiency of the internal and external business processes, like the direct filing and automated assessment of taxes; - <i>Organizational innovations</i>, focused on the creation of new organizational forms, the introduction of new management methods and techniques, and new working methods. Examples are the creation of shared service centres or the use of quality systems; - <i>Conceptual innovations</i>. These innovations occur in relation to the introduction of new concepts, frames of reference or even new paradigms, like the concept of New Public Management or the notion of governance; and - <i>Institutional innovations</i>, which refer to fundamental transformations in the institutional relations between organizations, institutions, and other actors in the public sector. An example is the introduction of elements of direct democracy, through referenda in a representative democracy.

Table 4: A typology of innovation consultancy (Gadrey and Gallouj, 1994)

Type of innovation	Definition and characteristics
<i>Ad hoc innovation</i>	<ul style="list-style-type: none"> - Original solutions (for organizational, strategic, fiscal... problems) in cooperation with clients. - Examples: original ad hoc legal solutions, new strategic or organisational solutions. - “Non-programmed” innovation - Appropriation and reproducibility issues
<i>Expertise-field innovation</i>	<ul style="list-style-type: none"> - Knowledge accumulation related to emerging fields of knowledge - Service provision related to these fields - Examples: in legal consultancy investments in new potential fields of law (upper space, information technologies, environmental protection...).
<i>Formalization innovation</i>	<ul style="list-style-type: none"> - Heterogeneous type of innovation seeking for tangibility - Different forms : methodologies, incorporation of technical tools in the process, organizational innovations, use of tool kits

2.3 From a linear model to an open model

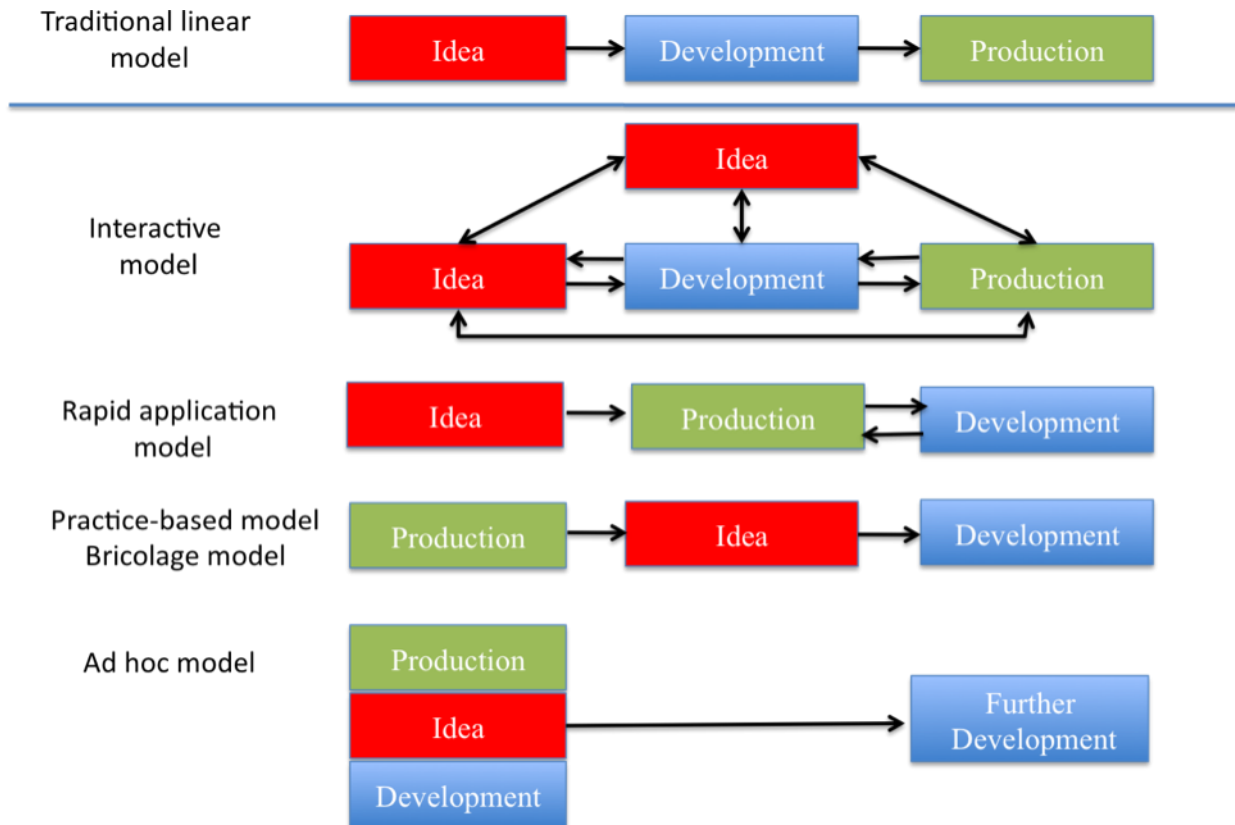
The dynamics of innovation can either be spontaneous (unpredictable) or planned (predictable). Innovation is planned and predictable when it takes place within clearly-identified structures (for example, R&D departments and project groups) and in accordance with pre-established processes. Planned innovation activities of this type are, of course, implemented by service organisations (Sundbo and Gallouj, 1999; Tidd and Hull, 2010). There is a strong theoretical tradition within the management sciences that recommends applying New Product Development (NPD) methodologies to services, that is, considering the creation of new services as part of planned and systematic processes within the framework of

a theoretical perspective termed New Service Development (NSD) (Scheuing and Johnson, 1989; De Brentani, 1991).

However, the literature on innovation in services has focused on the role of interactive structures and processes, forming part of a general open innovation perspective and covering a range of more or less sophisticated and formalised cooperative models (see figure 1).

The general open innovation perspective includes Kline and Rosenberg's chain-linked interaction model or interactive model mentioned earlier. However, it also covers a certain number of unplanned or emergent models such as the rapid application model, the practice-based model, bricolage innovation and ad hoc innovation. The rapid application model is a model in which planning does not precede production, as in the traditional linear model. Once the idea has emerged, it is immediately developed as the service in question is being provided. As such, the service provision process and the innovation process are one and the same (Toivonen, 2010). The practice-based model consists of identifying changes in service practices, developing them and institutionalising them. The bricolage innovation model describes change and innovation as the consequence of unplanned activities performed in response to random events, characterised by trial and error and "learning on the job" (Sanger and Levin, 1992; Fuglsang, 2010; Styhre, 2009). Ad hoc innovation (Gadrey and Gallouj, 1994; Gallouj and Weinstein, 1997) can be defined as the (original) solution development process for a corporate customer problem (see table 4). This interactive process, which requires the participation of the customer, is described as ad hoc because it is "unplanned" or "emergent", which means that it is consubstantial with the service provision process from which it can be separated only in retrospect. Ad hoc innovation is only recognised as such after the event.

Figure 1: The organization of innovation in services: from the linear to the open model



Open innovation also covers specific innovation networks (Public-private innovation networks in services or servPPINs) that are still relatively unknown² but which develop in a dominant service economy. These ServPPINs describe the collaboration between public, private and third-sector service organisations in the field of innovation (Gallouj, Rubalcaba, Windrum, 2013). They differ from traditional innovation networks in several ways. Firstly, the relationships between *public and non-profit stakeholders* and *private stakeholders* are placed at the centre of the analysis. Next, *service providers* are the key stakeholders in the process. Lastly (and the corollary of the previous characteristic), *non-technological innovation (service innovation)*, often neglected in the literature, is also taken into account. The development of ServPPINs in our economies can be interpreted as a statistical phenomenon and a social construction. In fact, although there is an actual increase in the number of ServPPINs, this increase is also due to a simple awareness of their existence, that is, the discovery of a reality invisible up until now. The recognition of this type of innovation network is closely linked to the recognition of forms of service innovation hidden from or invisible to our traditional indicators.

Open innovation also covers the user/customer/demand-driven innovation dynamic, which is particularly important in services (Sundbo and Toivonen, 2011).

3. Drivers and megatrends in innovation in services

² These innovation networks were the subject of a European project called ServPPIN (The Contribution of Public and Private Services to European Growth and Welfare, and the Role of Public-Private Innovation Networks, FP7).

According to Naisbitt's definition (Naisbitt, 1982), megatrends are socioeconomic transformations, which exist in the *long term* (several decades). They are characterised by the *geographical scope* of their sphere of activity (all regions and countries), the *scope of the socioeconomic and political subsystems* transformed, the *intensity of these transformations*, whoever is the actor concerned (political institutions, firms and their strategies, individuals and their consumption patterns).

Therefore, megatrends are radical socio-economic changes. They cover or determine, of course, radical innovation but also incremental ones. These megatrends are based on various drivers which interact in various ways and may compete or reinforce each other. The literature highlights several different drivers of innovation in services, which relate respectively to the supply side, demand side or both at the same time: 1. Industrialisation of services; 2. Technology (especially ICT) and R-D; 3. Globalisation/competition; 4. Demographic variables; 5. ICT-literacy; 6. Customisation; 7. Deregulation...

We examine here, in a general way, a certain number of megatrends, which seem to be important in the field of services and innovation in services (see Annex 2). Some of them are not new, but they are far from exhausted. This applies, for example, in numerous services activities, to the dialectic relationship between industrialisation and customisation (case n°1). This is also the case with the megatrend based on service regression (case n°4) or on product-related (or industrial) services (case n°5). Other cases are more recent and not yet recognised, as they should be. This is, for example, the case of the megatrends based on population ageing (case n°2) or on sustainable development (case n°3).

3.1 Case n°1 : the dialectic between industrialisation and customisation associated with ICT-technology and ICT-literacy

The first interesting megatrend, in services, has been at work since several decades, but its potential for evolution is still considerable. It concerns the dialectic relationship between industrialisation (productification) and customisation (servicisation). Considered independently one of each other, industrialisation and customisation are two important drivers of innovation in services. Nevertheless, their combination (in space or time), in the same firm or sector provides the basis for an important megatrend, which is also based on two other drivers: ICT technology and ICT literacy.

Firms can simultaneously adopt opposing industrialisation and customisation strategies. This is what we denote by the term synthesis or integration strategies. Such strategies are particularly common in large companies in the banking, insurance, retail and distribution, tourism and transport sectors, for example.

The dialectic between industrialisation and servicisation is particularly evident in financial services. Large banks and insurance companies today combine standardised quasi-products and automated self-service, on the one hand, with 'high value-added' and tailor-made services, on the other, these latter developed in the context of highly interactive service relationships in which customers play an active role. The first alternative reflects a strategy based on industrial rationalisation, the second one a strategy based on professional rationalisation, in which standardisation is rejected in favour of the development of problem-solving methods (in the style of consultants' methodologies).

Another example is retailing. Examination of the long-term evolution of the retail and distribution sector shows that supermarkets followed a natural technological trajectory of increasing mechanisation and economies of scale based on two fundamental innovations: self-service and the establishment of chains of stores. For a long time, the innovation model at work focused essentially on the materials logistics function (introduction of Fordist logistical systems) and on strengthening the self-service relationship and then, in a second phase, on the information logistics function. For some years, change in the retail and distribution sector has taken two new directions, which do not exclude the previous one, both of which fall within the scope of a servicisation dynamic: 1) the addition of ‘new services’ or new service relationships, such as information terminals for customers, home deliveries, the development of financial and insurance services, the opening of travel agencies and petrol stations and the introduction of individualised counter services; 2) the improvement of service relationships through the introduction of loyalty and credit cards and other benefits for loyal customers.

3.2 Case n°2: Ageing and its various consequences on innovation in services

The second interesting megatrend is heavily based on the demographic variable, but it also involves a large number of other drivers. However, the demographic driver is not homogeneous. In EU countries, it has different features, which can impact innovation: population ageing, population decrease, migrations. Eurostat’s projections³ forecast a decrease of working population by 52 millions in 2050, even if migratory flows are taken into account. The same source indicates that the share of elderly (more than 65 years old people) will reach 29,9 %, whereas it was 16,4 % in 2004.

We will confine ourselves here to the ageing variable. This variable impinges more or less on numerous other innovation drivers. It is linked by a causal relationship to most of the other drivers. Thus, ageing associated to the reduction of the whole population induces new and increased needs for productivity gains in the whole economy (and not only in services). These needs mobilise the “Industrialisation” and “Technology” drivers. The goal is to rationalise production processes and to mobilise technical equipments in order to offset the gap of human resources thanks to robotisation and automation...

However, population ageing also means the increase of the number of wealthy people with incomes beyond the average. These people constitute an interesting market (which is sometimes labelled grey or senior market), provided supply is able to fit their particularities. In this case, innovation may be based on following drivers: customisation, marketisation (which means the market replacing traditional household production), technology adaptation associated with ICT literacy. Indeed, population ageing leads to the implementation of new services and new technologies in order to meet elderly needs.

Ageing also means the increase of dependency, which is also a major source of innovations based on the same drivers (customisation, marketisation, technology adaptation associated with ICT literacy). However two other drivers of innovation play an important role in dependency : sustainable development in its social dimension and the institutional driver.

The major targets of innovation in care services for the elderly are the following ones (Djellal and Gallouj, 2006):

1) The structures or, more generally, the forms of assistance and residential provision (institutions, domiciliary services, networks, etc.).

³ Eurostat new release 48/2005-8 April 2005

- 2) The technologies. These are a set of tangible or intangible artefacts (technical systems, architecture and ergonomics, methods, etc.), which may have medical or non-medical purposes.
- 3) The human environment of the elderly, whether that be family carers or care personnel. For example the so-called care giver burden (that is psychological, social and financial in origin) is the driving force behind various innovation trajectories, which seek either to assess the burden or to cope with it.
- 4) The services provided to the elderly, which vary depending on the service medium in question (the various characteristics of the elderly individuals themselves, the goods they possess or use etc.). There is considerable potential for innovation linked to this target. Virtually any existing service can be adapted to the elderly population in order to extend the range of services on offer (domestic services, care services, financial and insurance services, leisure services, transportation, etc.).

3.3 Case n°3 : Sustainable development and the future of the service economy

A powerful megatrend, which is still at its initial step, is the megatrend based on the sustainable development question in its environmental dimension. Indeed, until recently, the service economy has developed independently of the sustainable development question, with the implicit hypothesis that (except for some of them such as transportation) services are environment friendly because of their intangible nature (Gadrey, 2010; Fourcroy et al., 2012; Desmarchelier and Gallouj, 2012).

Because of its importance, this megatrend is likely to mobilise directly or indirectly (and with various relationships) anyone of the individual drivers of innovation. Nevertheless, certain drivers are prominent. The globalisation driver is one of them. Indeed the sustainable development question is basically raised at the global level. It doesn't respect geographical boundaries (cf. pollution). Another one is the demographic driver, as far as sustainable development is not only concerned with environmental issues but also with social ones. The institutional driver is also important as far as sustainable development issues need national and international policies and rules. One can also mention the technology, R-D driver, as far as the source but also the solution of numerous environmental sustainability issues involve this technological variable.

The notion of sustainable development is characterised by four interdependent biases (Djellal, Gallouj, 2010): it is industrialist, technologist, environmentalist and defensive. As an instrument of militant protest and then as a major theoretical category, it was born and grew to maturity in an environment dominated by an all-powerful manufacturing industry reliant on continuous technological innovation that impacted on the environment. Before it acquired its social or socio-economic dimensions, sustainable development was (and continues to be to some extent) primarily ecological and environmental; its main concern was manufacturing industry's devastating effects on non-renewable resources and the environment. However (and this is a consequence of the four interdependent biases), this notion of sustainable development is also 'defensive', that is it is fundamentally concerned with the repair of damage (essentially to the environment).

These four biases persist in economies in which services are the main sources of wealth and jobs. However, services alter the terms of the sustainable development problematic. They play (and will increasingly be led to play) an important role in sustainable development, both

statically and dynamically, that is through the innovations they produce or induce. It is necessary to argue in favour of a service-based approach to sustainable development, which involves a loosening of the various biases in question.

Thus it is in the dominant service sector that the future of the sustainable development question will be played out, whether positively or negatively. At the moment, it seems that a large proportion of service activities have a fairly small environmental footprint compared with manufacturing industries, while at the same time producing essential socio-economic effects: it is services that generate most jobs in contemporary economies. They are also the main users of ICTs, which are generally regarded (although this is increasingly questioned) as having a relatively low MIPS (Material Intensity Per Service Unit)⁴.

Furthermore, non-technological (particularly social) innovation occupies an essential place in a sustainable service society (see section 2.2). Many new services, which may possibly be delivered through new forms of entrepreneurship (and this has been recognised by public policy), are sources not only of jobs (economic solutions) but also of solidarity (services to individuals living in hardship).

Finally, whether the innovation is technological or non-technological, environmental or socio-economic, services play an active role in the production of innovations, not only those that cure or repair damage inflicted on the environment or on individuals' socio-economic well-being but also those that are preventive and proactive (education of populations, training related to environmental norms or labels, etc.).

Overall, as stated by Gadrey (2010), the future of the service economy is also played in the environmental arena and is tightly linked to the innovation it can or cannot generate. The service relationship, which is considered one of the specificities of services is likely to raise environmental problems, as far as it is based on displacements of consumers towards providers or vice-versa (Fourcroy et al., 2012). An important issue at stake here is the measurement of the environmental impacts of services. Gadrey carried out a very interesting prospective work on the future of service sectors at the 2050 horizon. Taken into account sustainability constraints, he concludes that one shouldn't expect an increase in the share of services in the long term. He forecasts the decline and disappearance of whole parts of the service economy. Thus, he distinguishes winner services and loser services. According to him, loser services include: road and air transport, hostelry, catering, tourism... Winning services include repairs, recycling, maintenance services, local government, services for young children and the elderly.

3.4 Case n° 4: The service regression dynamics

It may seem paradoxical to link the terms innovation and regression. It is nonetheless the case that innovation processes in many service activities follow a service reduction trajectory. That is what Djellal and Gallouj (2005, 2008) call a "regressive model" of innovation. This megatrend manifests itself in various service sectors: in air transport with low cost companies, in hostelry with budget hotel chains such as Formule 1 or Travelodge, in large scale retailing with hard discount, and in catering with fast food industry. Health sector also provides

⁴ The MIPS indicator (Material Intensity Per Service Unit) measures the degree of utilisation of natural non renewable resources to produce a good or a service.

examples of innovations following this regressive megatrend. Indeed there are also hospitals hyperspecialised in very specific types of patients.

The success factor of this megatrend is the reduction of the cost and price structure by seeking minimum service. The main drivers underlying this megatrend are the following ones: service industrialisation, customisation, ICTs and technology, globalisation/competition and the institutional driver.

Service industrialisation seeks for cost reduction. It basically takes two complementary forms: the use of labour saving technical systems and the implementation of production modes based on standardisation. This is particularly obvious in the case of Mc Donald's, and of Accor Formule 1 hotels.

ICTs play here an essential role, especially in activities where booking is necessary. They play an important role in the success of low cost airline companies, which abandoned physical point of sales and replaced them with reservation technical systems: e-reservation, e-ticketing, ticket-less travel. In hostelry, the French group Accor was the pioneer of the centralised reservation system, initially by phone, and now increasingly online.

The institutional driver is, in certain activities, a *sine qua non* driver of innovation. Thus, it is deregulation policies that are the source of the creation of low cost companies in air transportation. In large scale retailing, regulation in the field of geographical location, opening hours play also an extremely important role.

As regards the competition/globalisation driver, one can often observe that these low cost or service regressive formats are implemented in a context of high national or international competition. The services light formats make it possible to enter international markets and to fight against international competition in domestic markets.

One of the characteristics of the low cost business models, whatever the sector of activity, is that it shouldn't only be considered in terms of competition with traditional models. Indeed, it also creates new markets. Thus, the Formule 1 hotel accomodates customers who wouldn't otherwise take a hotel (for example, lorry drivers...). Similarly, low cost airline companies exploit certain niches where major companies are absent. Therefore they provide a traffic induction. They also catch customers who where not taking planes or who were preferring trains.

3.5 Case n° 5: Product-related services

Another interesting megatrend is the rise of what is called *product-related* or *industrial* services. These are the whole range of services provided during the production or the selling of an industrial product: pre-sales, at-sales, after-sales services and independent from sales services⁵ (Mathieu, 2001; Vanderwe and Rada, 1988 ; Davies, 2004)

The principal drivers underlying this megatrend are globalisation and competition, on the one hand, and the process of customisation, on the other hand.

⁵ These are services that are independent of the product and the production process, for example, child care, sporting and recreational services,...

Indeed, in the field of manufacturing products, high competition and globalisation have stimulated productivity efforts and cost reduction, as well as differentiation strategies. This differentiation of the product can be achieved by service addition. Therefore the source of value added is located in the peripheral service related to the product rather than in the product sold itself. There are numerous old or new examples of such a situation. The major part of the profits of printers or photocopiers manufacturers lies in maintenance and delivery of related products and services. Some years ago, the profits generated by after-sales services were the major part of the gross margins of car manufacturers. The success of Sony Playstation 2 was primarily associated with the selling of games rather than the selling of consoles.

One can widen the scope of this megatrend by integrating the dynamics of externalisation and outsourcing. Transportation and IT outsourcing is not new, either for industrial or service firms. What is new is the scope and the nature of what is contracted out to external providers. Thus, in US very small pharmaceutical laboratories are able to compete with the biggest firms by outsourcing marketing and sales to specialised service firms.

4. Innovation gap, performance gap and policy gap

The previous sections were focused on the innovation gap and the ways to fill it. Economic performance also poses serious problems of definition and measurement, and here too hidden forms of performance can be identified. There is also a performance gap. These two gaps have consequences on the interpretation of the fundamental relationship between innovation and performance and major implications in terms of public policy.

4.1 A performance gap

The performance gap reflects the difference between the reality of performance in a service economy and performance as measured by the traditional economic tools (productivity and growth). These hidden forms of performance are also not unconnected with the service-based nature of economic activities. Once again, an organisation or an economy in its totality may perform better (or worse) than is suggested by the indicators of productivity or growth. In particular, this notion of hidden performance brings into play that of sustainable development, defined in both socio-economic and environmental terms, and, more generally, other *worlds of performance* than the industrial and technological world.

This performance gap has its roots in classical economic thought, and in particular the work of Adam Smith who compared the productive work involved in manufacturing with the unproductive work involved in services, which vanish at the very moment they are produced (see section 1.1 above). The main criticism generally aimed at the service economy is that it suffers from low productivity. This characteristic was for a long time (and indeed still is) regarded as intrinsic to services, so much so in fact that it provided Jean Fourastié (1949) with the main criterion for the first positive definition of the service sector. It also lies at the heart of Baumol's models of unbalanced growth (Baumol, 1967), in which it characterises the so-called stagnant sectors. It is reflected in contemporary discourse by the diagnosis of a new pathology, namely Solow's paradox, according to which computer technologies exist everywhere except in productivity statistics.

In reality, productivity and performance in services are not (or are no longer) poor by definition. They have undeniably increased. This increase can be explained by both the actual strategies adopted by the economic actors and a knowledge effect produced by our improved understanding of the theoretical and methodological problems posed by services.

Firstly, the economic actors concerned are not inactive. Service firms and organisations are capable of effectively implementing rationalisation strategies, which tends to give the lie to the notion that productivity in services is inevitably low (Gadrey, 1996; Djellal and Gallouj, 2008). It is not only in operational services that these strategies are at work. They are also deployed in knowledge-intensive services.

Secondly, the performance gap can also be filled by an improved theoretical and methodological understanding. Critical analyses of the notions of productivity and growth are frequently tackled in similar terms, since in both cases it is the essentially the nature of the product that is at issue. The terms of this critical debate can be divided into two groups of arguments.

The first argument concerns measurement error. The hypothesis is that the level of productivity in services is undoubtedly less problematic than the methods used to measure it. Attempts to use this industrial and technical indicator come up against the problems of identifying the output of service activities. Thus the unit of output for a computer manufacturer is a computer, but what is the unit of output for education, national defence (particularly in peacetime), the police or even the ministry of foreign affairs? Thus this first argument calls into question the results and suggests corrections. In the case of public services, for example, the measurement of output in terms of input (which presupposes that productivity remains static) has been abandoned and replaced by measures of output based on the activities that make it up.

The second argument calls into question the very notion of productivity, or at least its absolutism. The idea is that, in services to a greater extent than elsewhere, performance cannot be captured solely through the notion of productivity. Consequently, a multi-criteria form of assessment is required, one that takes account of the multiple dimensions of performance: technical performance of course, but also commercial performance (relative to monetary and financial values), civic performance (relative to equity, equal treatment, social cohesion, respect for the environment, etc.) and relational performance (quality of interpersonal relations, empathy, trust relations, etc.). (cf. table 5).

Table 5: An application of the multi-criteria framework to insurance (Gadrey, 1996)

	Industrial and technical world	Market and financial world	Relational or domestic world	Civic world
Direct output (short term)	'Volume' of claims, 'volumes' of contracts (by homogeneous groups of cases)	Premiums, compensation claims paid out	Quality of direct relations between staff and customers (business relations, relations with experts, etc.)	Refusal to go too far in the search for private information on the insured (health, history, etc.)
<i>Performance relative to direct output</i>	Technical productivity, ability to process technical operations more	Increase in premium levels, improvement in the claims/premiums	Improvement in customer satisfaction indicators in respect of the service	Proportion of contracts in which the company agrees to accept additional risks for

	quickly, to settle claims more efficiently, reductions in waiting periods and error rates, etc.	ratio, yield on short-term investments, etc.	relationship	civic reasons or to avoid discrimination
Indirect output (long term)	Concepts of little relevance except perhaps for evaluating the impact of insurance on the technical performance of insured companies and hence on economic growth and innovation.	Financial stability and security (of customers and of the company)	Customer loyalty/retention	Premium structures that equalise, for example, differences between the generations or social classes (Michel Albert's 'Rhenish' model)
<i>Performance relative to indirect output</i>		Company's long-term financial yield indicators. Contribution of insurance to the financial health of customers and of the economy.	Reduction in customer turnover	Support for a form of financial solidarity through inter-class or inter-generational pooling of risks

4.2 The relationships between innovation and performance

Figure 3 below describes the different relationships between visible and invisible innovation on the one hand and visible and invisible performance on the other hand.

Visible innovation certainly leads to visible performance (relationship 1), but it can also result in an invisible performance with regard to socio-civic and ecological sustainability (relationship 2). Technological innovation can indeed also be a source of social, civic and ecological benefits, and certain technological trajectories are more guided than others by the seek for socio-economic or ecological sustainability. For example, technological innovations responding to the problems of the elderly (domestic robots, smart home, electronic surveillance...) represent a powerful innovation trajectory in ageing service societies (see section 3.2 above). The role of ICTs in supporting citizens participation to democratic debates is another interesting example.

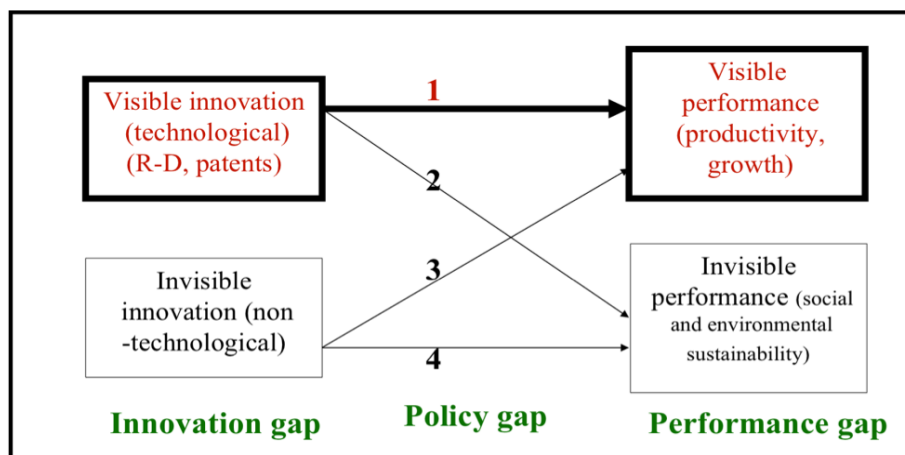
Relationship 3, which links invisible innovation to visible performance, means that the non-technological forms of innovation are also a source of growth (visible performance). It is the reason (when invisible innovation efforts are significant) for the incorrect interpretation of the innovation-performance relationship, which takes account of high growth for a relatively weak innovation effort.

Relationship 4, finally, which links invisible innovation to invisible performance, assumes a favoured relationship between non-technological innovation and invisible performance. There seems to be a strong correlation between the invisible component of innovation and the invisible component of performance. Indeed proximity services, for example, are the setting for significant social innovation activity, which escapes traditional indicators, whereas their role in the resolution of social problems is fundamental. More generally, if one considers performance from the viewpoint of sustainability, one notes that, although they are not dramatic, many non-technological, and particularly social, innovations, play a significant role

in this. Amongst others, we can mention certain forms of sustainable tourism, the many innovative initiatives in the field of care for the elderly, childhood, social integration, and in the financial field, micro-credits to respond to the problem of banking exclusion...

Because of the existence of hidden performance, innovation efforts can be more effective than the measures indicate. Thus, for given innovation efforts, an apparently weak (traditional) performance can be enhanced from the viewpoint of alternative performance. Conversely, an apparently high (traditional) performance can be put into perspective, insofar as growth and productivity gains are tarnished by ecological or social damage.

Figure 3: Innovation gap, performance gap and innovation-performance relationship



4.3 The double gap: a challenge for public policies

In view of the two gaps identified in this work, one can assume that public innovation policies are, to a certain extent, inadequate. Indeed, they rely on a partly inaccurate analysis, and consequently suggest solutions that could prove to be inappropriate.

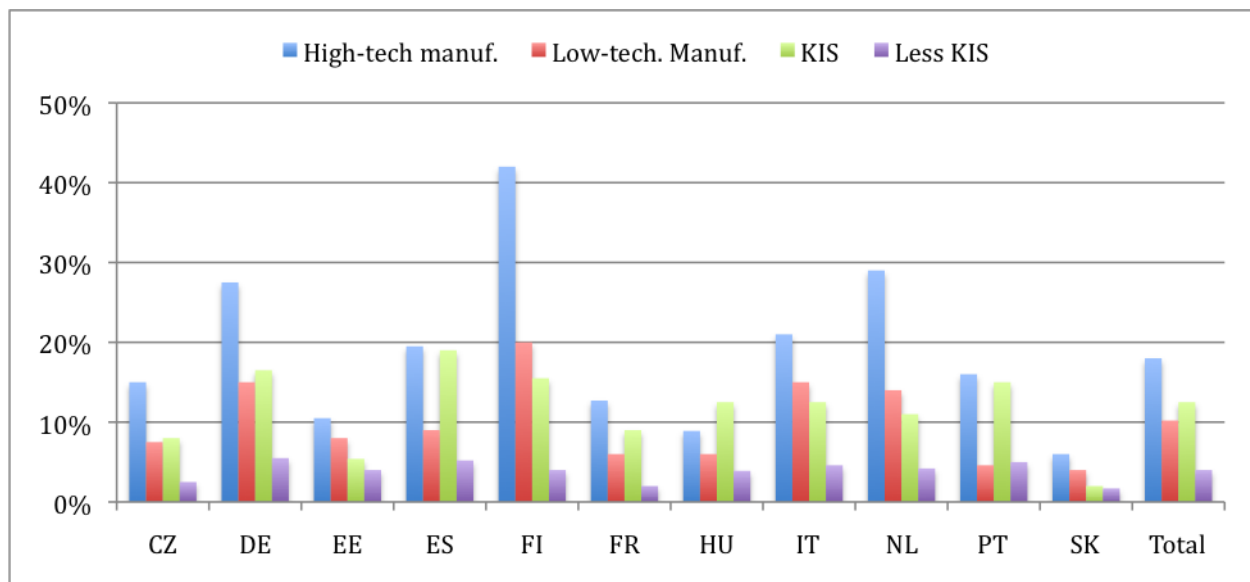
In order to carry out their diagnosis, public policies generally favour relationship 1, which links visible technological innovation to visible performance (growth, productivity). Figure 3 illustrates well all the errors in analysis and the paradoxes that can follow from such a hypothesis. We can thus identify a weak innovation effort at the same time as a high (growth) performance. In the case of UK, for example, NESTA (2006) observes a high economic performance in the 1990s and early 2000s for a lower level of innovation than in other countries. For example, R&D per capita expenditure in GB is two times lower than in Sweden and in Finland. It is lower than in France or in Germany. The number of patents per inhabitant is much higher in Germany, Japan and the United States than in UK. The explanation of this paradox lies in the British innovation gap. In fact, part of the performance can be explained by the invisible innovation effort.

We can also identify an apparently higher innovation effort, which does not fulfill its promises on performance. This is the case for France in the same period. To establish a satisfactory analysis, it is necessary to take into account all the other relationships between innovation and

performance (relationships 2, 3 and 4), which can contribute to different interpretations of innovation efforts and levels of performance achieved.

In view of the diagnosis established on the basis of relationship 1, the solutions recommended by the public authorities naturally consist of promoting technological innovation, that which is based on scientific and technical R&D activities and which can be appropriated by patents. These strategies mainly concern public research and the industrial sectors, in particular high technology (see Figure 4. As regards training systems, policies will consist of favouring scientific and technological training. As the OECD (2005) emphasises, the innovation policy of member countries was mainly considered to be an extension of R&D policies. Thus, in economies that are, however, largely dominated by services, these technologist and industrialist policies have also been transposed to services. In the same way as economic analysis, public policies of support for innovation in services are dominated by an assimilationist perspective (Rubalcaba, 2006; Den Hertog and Rubalcaba, 2010).

Figure 4 : Share of firms receiving public support by country and sector. Source: OECD calculations based on CIS 2008 microdata (Eurostat) for INNOSEV



The main lesson to draw from the preceding analyses in terms of public policy is that, to take into account the double gap that has been identified, the public authorities should break with their technologist orientation and try to promote invisible innovations and performances.

It is thus necessary to emphasise innovation and R&D policies that are specific to services (perspective of differentiation), in other words, policies that are not content with supporting technological innovation and R&D, but which also favour non-technological forms of innovation and R&D. As far as the source of the gap is not confined to services, it is also necessary to support innovations in services within the manufacturing and agricultural sectors. If it happens, this recognition of invisible innovation in public policies should also redirect priorities on education policy. Indeed, one should also support the development of the necessary skills in non-technological forms of innovation, whether this is skills that produce or which absorb these innovations. These skills do not only concern an elite, they should be disseminated to all levels of the population. This is particularly obvious with regard to social

innovations that can be produced and implemented in the informal and domestic sphere (voluntary work, community organisation) as in the formal sphere (or social entrepreneurship). All services of course are concerned by these innovation policies. But some sectors appear to be more concerned than others. This is the case with the KIBS, which contribute strongly to the innovation gap, both through their own internal non-technological innovation, but also by that which they produce for their customers. This is also the case for the numerous proximity services, where many social innovations are implemented.

If one considers performance in terms of sustainable development, one again notes that it is the technologist or assimilationist perspective which dominates. Most of the public policies of induction of sustainable innovation fall within such a perspective, which consists of supporting sustainable technological innovations in different ways: funding, taxation (for example, by granting tax credits for clean technologies or which save energy), public procurements, the dissemination of information... In order to favour invisible performance more, it is also necessary here to implement demarcation policies which emphasise the specificities of sustainable innovation in services and in particular social innovations.

Conclusion

The relationship between innovation and performance (equated with growth) is a major economic relationship, which has been the subject of an extremely extensive literature. In post-industrial economies, the two terms of the relationship raise several problems, which have been the subject of a separate literature.

In a highly tertiarised economy, service innovation partly escapes the tools of traditional economic analysis. One therefore observes an innovation gap. However, if the full extent of innovation efforts in services is to be properly captured, those engaged in the analysis, whether they be economists, sociologists or management specialists, must themselves make efforts to adapt or even innovate, both conceptually and methodologically. The traditional analytical tools are not always able to account fully for the new service and knowledge economy. This is one of the reasons why analyses are 'locked' in what in organisational sciences is known, metaphorically, as a 'competence trap'. Of course, this need for conceptual innovation is reflected in a need to adapt the actual means of measurement. Thus the efforts of researchers converge and intertwine with those of national and international statistical institutions. Most of the OECD manuals, for example, which set out the guidelines for defining and measuring R&D and innovation, have recently been revised in the light of the new service and knowledge economy, or are in the process of being so revised.

It is important, nevertheless, to recognise that the dynamic of service industries and those of the other sectors of the economy are characterised by a similar dialectic of convergence and divergence. This dialectic is reflected, for example, in the fact that the 'service dimension' or the service relationship have a certain degree of universality that extends beyond sectoral boundaries to worm its way into the heart of manufacturing production and agriculture, thereby opening the way for new forms of innovation (intangible products and processes, customised innovation, ad hoc innovation) as well as for new modes of organisation and incentives to innovate. This dialectic is also reflected in the universality of information and communications technologies (ICTs), which have introduced tangible anchor points into services that facilitate, if not a certain industrialisation of service provision, then at least a

form of ‘industrial rationalisation’ that links them to the traditional forms of innovation without for all that abolishing natural specificities. Thus researchers must concentrate their efforts not only on identifying possible specificities but also on developing integrated analyses of innovation, that is constructing general theoretical models that are independent of sectoral contexts.

Performance for its part continues to be defined in terms of growth and productivity, while other forms of assessing performance prove to be necessary. One therefore observes a performance gap. Performance in service activities cannot be captured solely through the notion of productivity. Attempts to measure this industrial and technical indicator come up against the difficulty of identifying the output or product of service activities. It may therefore be useful to adopt a multi-criteria method of evaluation of the performance that takes account of its various facets: technical and financial but also civic and relational.

Economic analysis and public policies favour the relationship between visible innovation (identified by traditional definitions, R&D and patents) and visible performance (equated with growth). They therefore emphasise technological innovation that is a source of growth. However, the double gap that has been identified reveals much more complex relationships, which can question the relevance of diagnoses and the validity of public policies supporting innovation. It therefore appears that these policies should adopt a demarcation perspective, which allows one to take account of and support the specific forms of innovation (in particular in services) and the most dynamic and most strategic sectors (for example, the KIBS), but also a certain number of economic sectors that are sources of social innovations (proximity services). These policies, whatever the form of innovation (technological or non-technological), should also favour less visible performance (sustainable performance).

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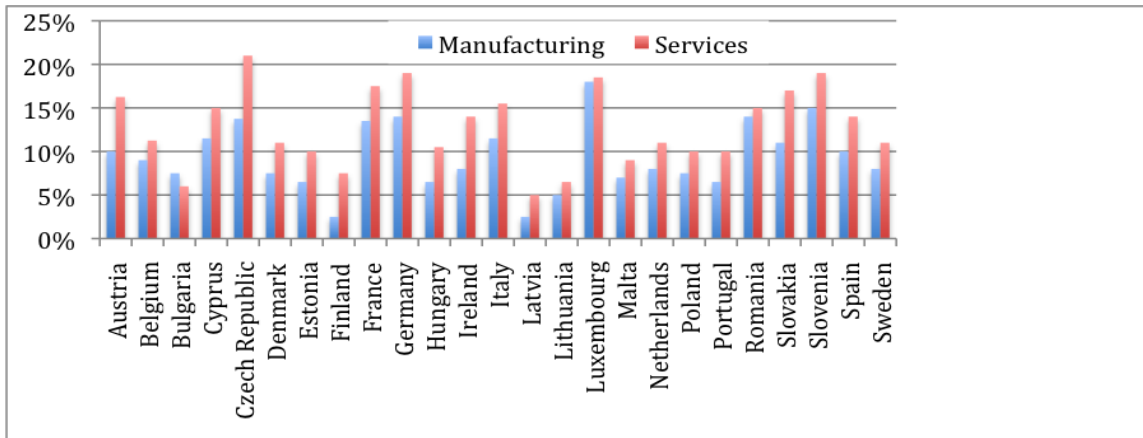
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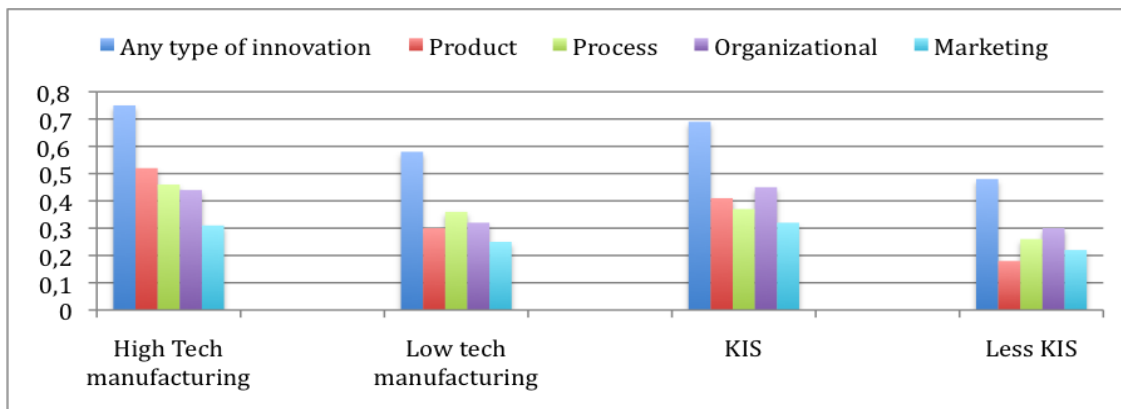
Annex 1: Some general statistical results about innovation in services and services innovation

Share of firms introducing non technological innovation (organizational or marketing innovation).

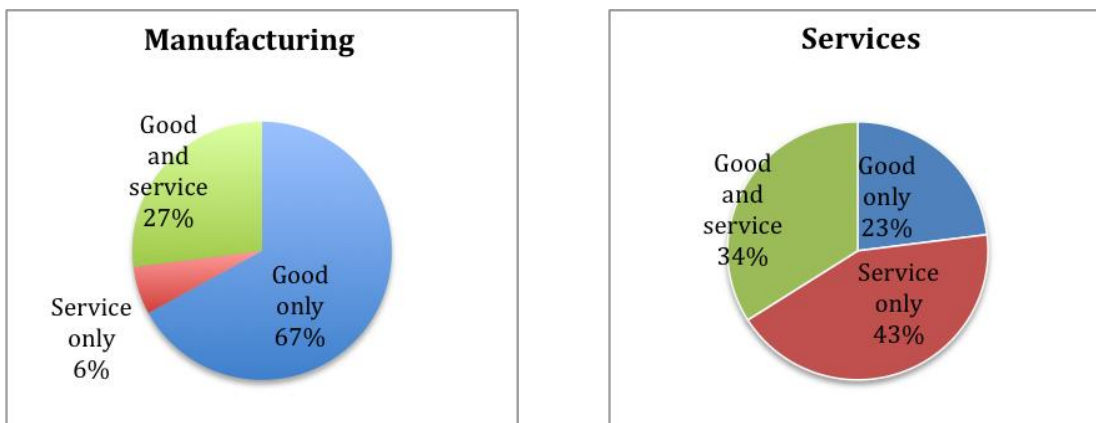
Source: OECD based on CIS 2008



Share of innovative firms by sector and type of innovation (EU 16). Source: OECD calculations based on CIS 2008 microdata (Eurostat) for INNOSEV



Firms innovating in good and/or in service by sector (EU 16). Source: OECD calculations based on CIS 2008 microdata (Eurostat) for INNOSEV



Annex 2: Examples of megadrivers in innovation in services

